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discussions respecting experience and knowledge. More than often it has been regarded as an abstract form of self-evident apprehension, whose chief, and perhaps sole, function is to mark the limits of reasoning. How it may have come into our experience has been humorously and seriously debated from Locke downward. It may not be an exact source of knowledge, but this negation does not exclude the peculiar significance attached to *experiencing* the relation in question. The two cases following indicate that there is some meaning to the 'principle' when found in conscious processes at an earlier time.

A bright child, Helen B., four years of age, whose development has been normal in all particulars, perplexed her mother and myself by adding to a conversation, in which she was taking no part and which had no apparent concern for her, these words: "Whatever is alike is the same. If you are good, you have to be good; if you are bad, you have to be bad. Whatever is alike is the same." Tactful questioning failed to bring out any evidence that the utterance was an echo from something the child may have heard. The meaning of the statement seemed to be clear to the child, though able to explain or expand it in no other way. She persisted in the assertion with considerable show of feeling, amounting almost to triumph.

Another and more recent instance is that of a boy in his sixteenth year. In a certain class the teacher was endeavoring to get another pupil to complete the sentence, "A dog is—," for purposes of illustration. After several examples and some hesitation on the part of the second pupil, the first jestingly ventured to supply 'a dog,' the sentence then reading: "A dog is a dog." The teacher accepted the suggestion as 'all right,' and showed how such statements could be made. The boy, however, was confused with astonishment upon learning that his suggestion had passed from jest to earnest, and required a rather long period of time to recover and adapt himself to this relation, which had apparently never occurred to him previously.

These rather opposite cases go to show that the 'principle' is not utterly void when it first arises in the conscious processes, however thor-

oughly one may claim it to have been operative in primitive mental activities.

EDWARD F. BUCHNER.

NEW YORK.

#### SCIENTIFIC LITERATURE.

*A Popular Treatise on the Physiology of Plants for the Use of Gardeners, or for Students of Horticulture and Agriculture.* By DR. PAUL SORAUER. Translated by F. E. WEISS. London and New York, Longmans, Green & Co. 1895.

One of the excellent features of this book is that there has been a consistent endeavor on the part of author and translator to make it a book clearly within the grasp of the persons for whom it is intended.

The author has succeeded in dealing with many of the problems of nutrition, diffusion, assimilation, etc., in a way that is not only attractive, but can be understood by one who has had little previous training in the study of plants.

After the introduction the author takes up first the structure of the root, and in connection with the structure discusses also the function of the root in the processes of absorption and conduction of nutrient materials. This is followed by a chapter on the nutrition of the root, dealing with the substances in the soil which act as plant food, the effect they have on the plant and the form in which they are taken up by the plant. Practical suggestions are made concerning the best treatment of the soil, the nutrition of pot plants, etc. The treatment of roots in transplanting, in repotting, is also considered.

The structure of the stem and leaf are treated in the same readable way in relation to the functions which they play in the general plant economy. The remaining chapters are devoted to plain directions for pruning, propagating, watering and the general nurture of the plant and seed, from the standpoint of the horticulturist and gardener, and this part of the book, at least to one who deals more with the principles of plant development than with horticultural practice, seems to be admirably done.

GEORGE F. ATKINSON.

*Contributions to the Analysis of the Sensations.*

By ERNST MACH. Translated by C. M. WILLIAMS. Chicago. 1897.